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indicated, no modification or adaptation in the process of reproduction. But in the infection of the ova with a resting stage is involved a selection both of the definite organ and of the cell which becomes infected. Further, the parasite must assume a resting condition adapted to undergo successfully the changes indicated in the development of the adult insect from the eggs and sometime in the latter process must reach the suitable location. In the case of the fly such a location will be the alimentary canal of the insect, while in the tick which is to transmit the disease-producing organisms the suitable location will be rather the salivary glands, as suggested by the observations of Christophers. In any event the interrelations are evidently extremely complicated. The infection of the fetus by tissue-penetrating protozoa is purely incidental; the infection of the ova and through them of the second generation is a complicated biological process, involving essential modification in the life-history of the parasite and important morphological adaptations to new conditions of life.

A Society for the Destruction of Vermin.—Recent demonstrations as to the agency of mosquitoes, flies, bedbugs, rats and other household pests in transmitting serious diseases has taken such active hold on the British mind that there has been organized in London a Society for the Destruction of Vermin. It is incorporated under the Board of Trade regulations as a public association not formed for the object of making profit. The work the society has set itself to do is: (1) Collect information from all sources on the distribution and life-history of vermin. It will pay special attention to the part played by vermin in disease causation. (2) Disseminate as widely as possible the acquired knowledge by means of the general press, and also by special reports, leaflets and lectures. It will endeavor to make known to the public the dangers connected with each kind of vermin, the necessity for exterminating certain species, and the best means of destruction. (3) Carry out experiments in the field, test any promising measures suggested for the destruction of vermin, and, if funds permit, distribute gratuitously, to such persons as are unable to afford the expense, the necessary substances and apparatus. (4) Organize, in cooperation with other associations and public bodies, a practical campaign for the destruction of vermin. To conduct operations an active committee has been formed. (5) Encourage and assist in any legitimate

way the operations of rat and sparrow clubs and similar bodies.

The services of the society will be placed at the disposal of municipalities, boards of health, agricultural societies, shipping and deck companies, and other bodies interested in the suppression of vermin. The society has already received the support of many eminent physicians, bacteriologists and chemists, together with that of agricultural and poultry organizations, public associations and other bodies.

II. B. W.

PLANT CYTOLOGY

Polar Organization of Plant Cells.—Research in plant cytology has resulted in conflicting views as to the extent of such polar organization of plant cells as is well known for certain animals from the work of Rabl, Van Beneden, Flemming and others. Some of the algæ present clear evidence of such polarity, the best known example being *Stypocaulon*, which has a center in the form of an aster with a centrosome, present at the side of the resting nucleus and dividing previous to each nuclear division, or mitosis, to establish the poles of the spindle. A similar aster is present at the tetraspore mother-cells of *Dictyota*. Other algæ such as *Fucus* and *Corallina* show highly developed centrospheres at the poles of the spindles, but investigations so far indicate that they are formed *de novo* with each mitosis and that there are no permanent centers associated with the resting nuclei to give polarity to the cells.

The research of recent years on the cells (particularly the spore mother-cells) of pteridophytes and spermatophytes has failed to support certain claims for the presence of centrosomes in these groups of plants, and has indicated that their cells are without visible polar organization. As nuclear division approaches in the spore mother-cell fibrillæ appear in the cytoplasm, at first arranged radially, but later becoming associated in cone-shaped groups (constituting the multipolar stage), and at last arranging themselves to form the two opposite poles of the final bipolar spindle. Among the bryophytes, the liverworts have received considerable attention. In this group well-differentiated centrospheres are present at the poles of the spindles, but these are described by all investigators as arising *de novo* and they have not been reported in association with the resting nuclei.